World
2025 Demand Projections

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The Story Begins with:

People…

Productivity…

And Planes!

The Chapters Unfold with:

More People…

More Airplanes…

Airspace and Procedural Changes…

Understanding Socio-economic Drivers…

Oceanic Structure that must Look Domestic…

The 2025 Ocean is not a technology push

It's integration and airspace/procedures

People…

World Demographics by 2025 will support global economic expansion

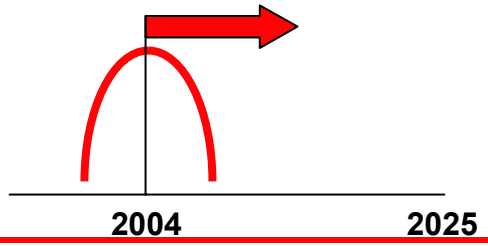
Increasing wealth leads to increasing business and travel

Aviation needed to fuel expansion

Population Factoids:
Growth in developing economies outpacing North America & Europe

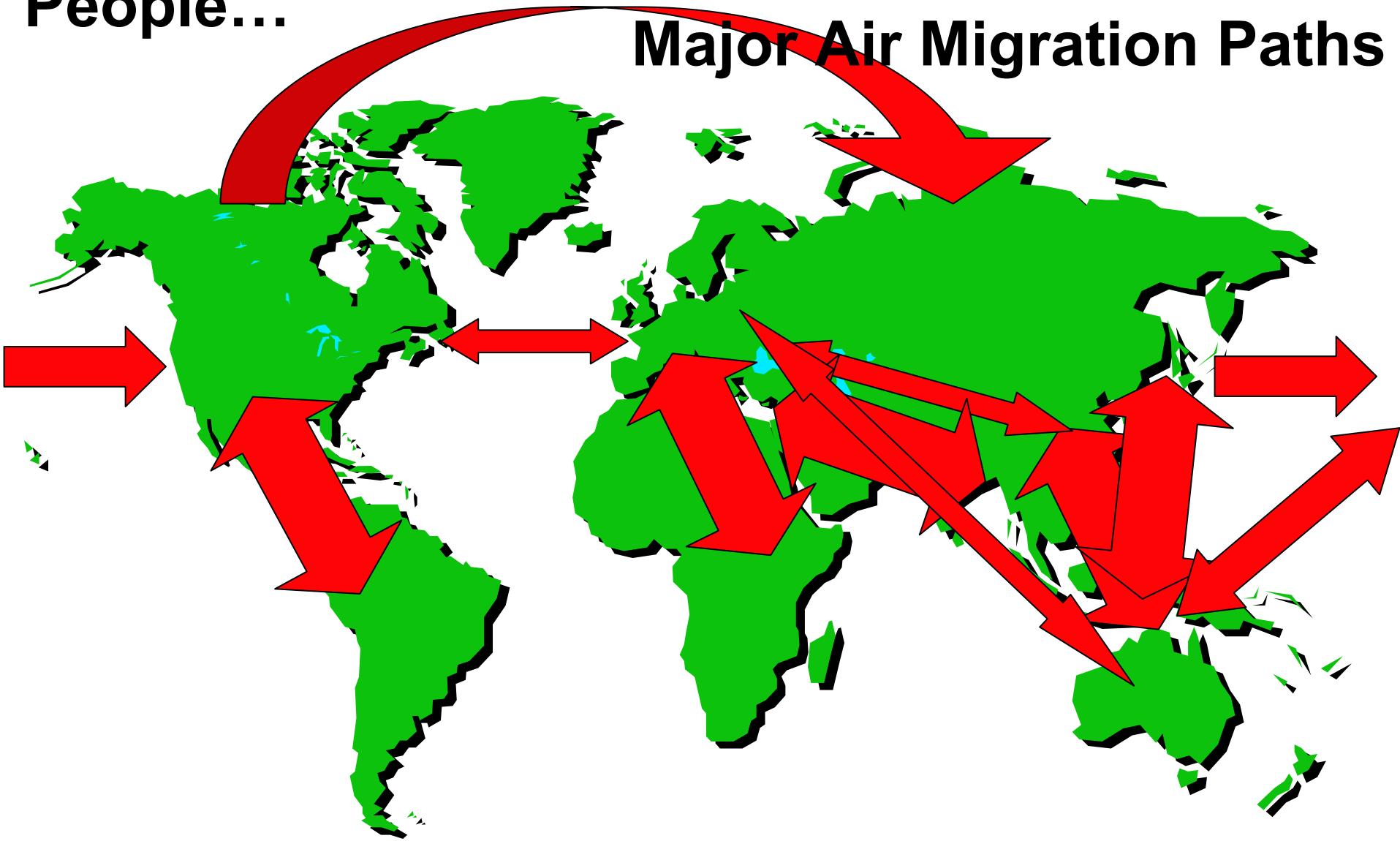
Tracking the “baby boomer” population hump

- A baby boomer is someone born between 1946 and 1964
- By 2025, these people (us) will be between 61 and 79 and increasingly global mobile



People…

Major Air Migration Paths



People…

A point of perspective…

- **US Population will grow by 49%** during the next 50 years
- After 2030 the rate of increase might be the slowest since the Great Depression as the size of the "baby boomers" dies off
- The **Hispanic population** will increase by **188 %,** stimulating travel across the Americas
- The **Asian population** in the US increases by **213 %** mostly in California
- The Los Angeles area adds nearly 800 new residents per day
- California's 17.7 million more people equals the current population of the state of New York

2025 Population Factoids:

California
+ 17.7 million

Texas
+ 8.5 million

Florida
+ 6.5 million

Productivity…

- A relationship exists between a Nation's gross domestic product (GDP) and revenue passenger miles (RPM) or revenue passenger kilometers (RPK)
- GDP has a steady track record and shows economic growth for nations
- Boeing and Airbus project RPM demand beyond national aviation forecasts
- GDP supports the air transportation market
- Historic data is available for most Nation's GDP
- An RPM is a paid and occupied seat traveling a mile - on a flight to Los Angeles you are 2,300 RPMs

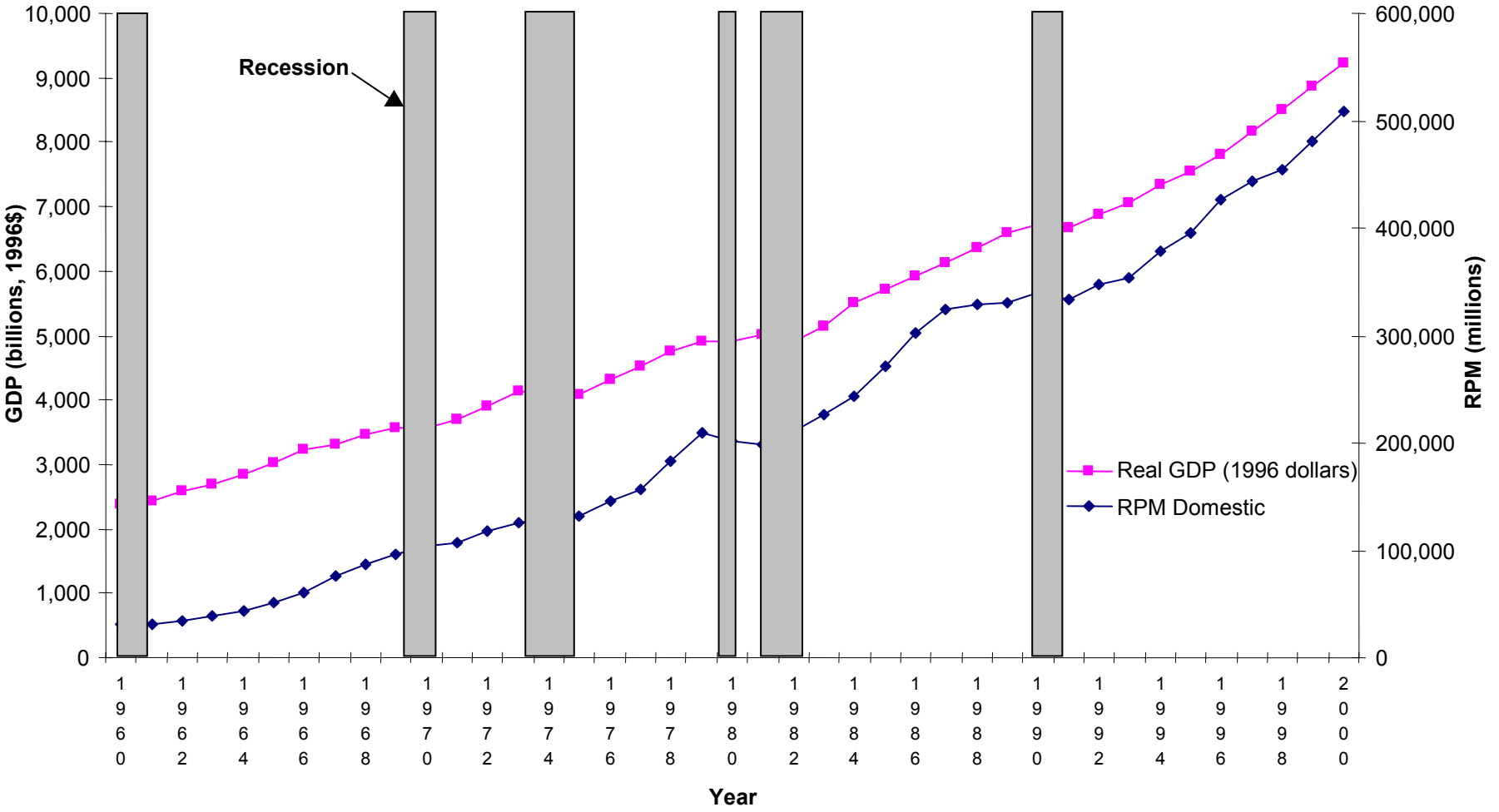
There are Billions and Billions of RPMs

Productivity…

GDP and Domestic RPM: 1960-2000

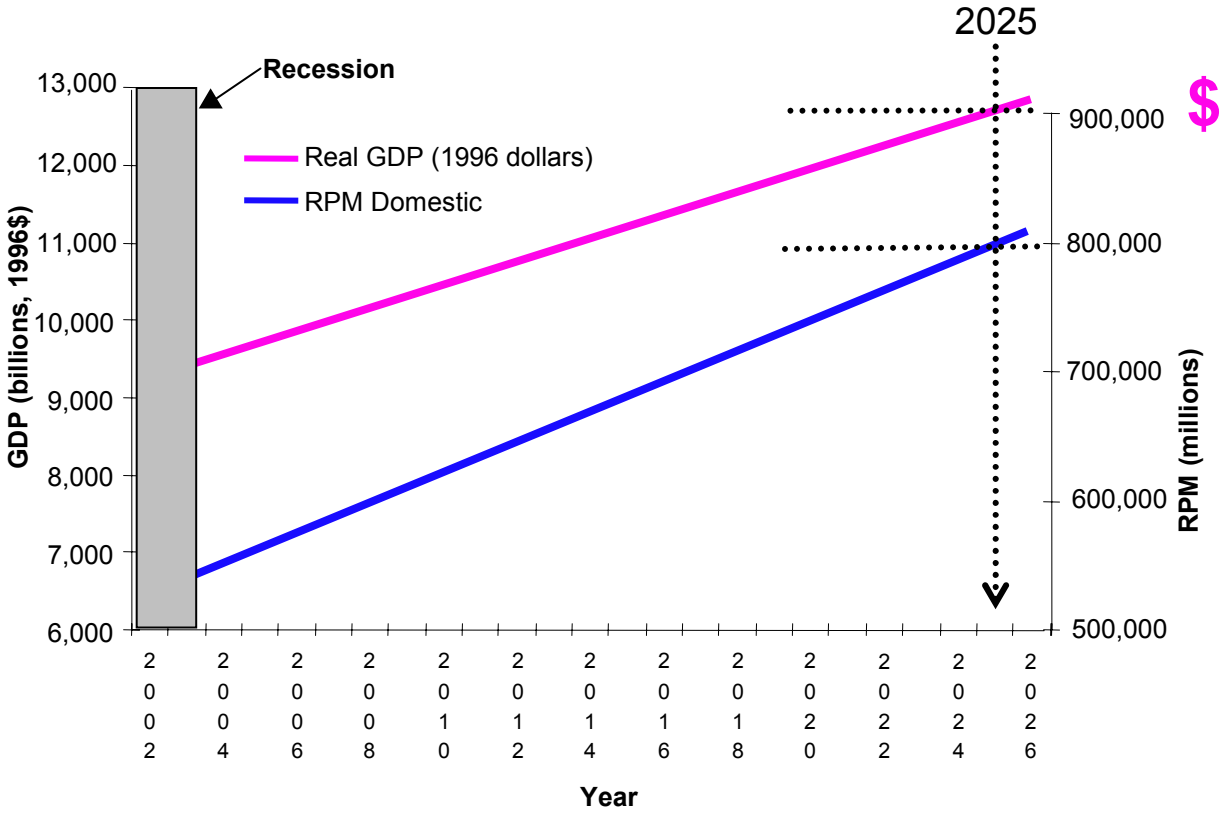
Historic Baseline

RPM data from Air Transport Association
GDP data from Bureau of Economic Analysis, DOC
Recession markings from Dow Jones (approximate)



Productivity…

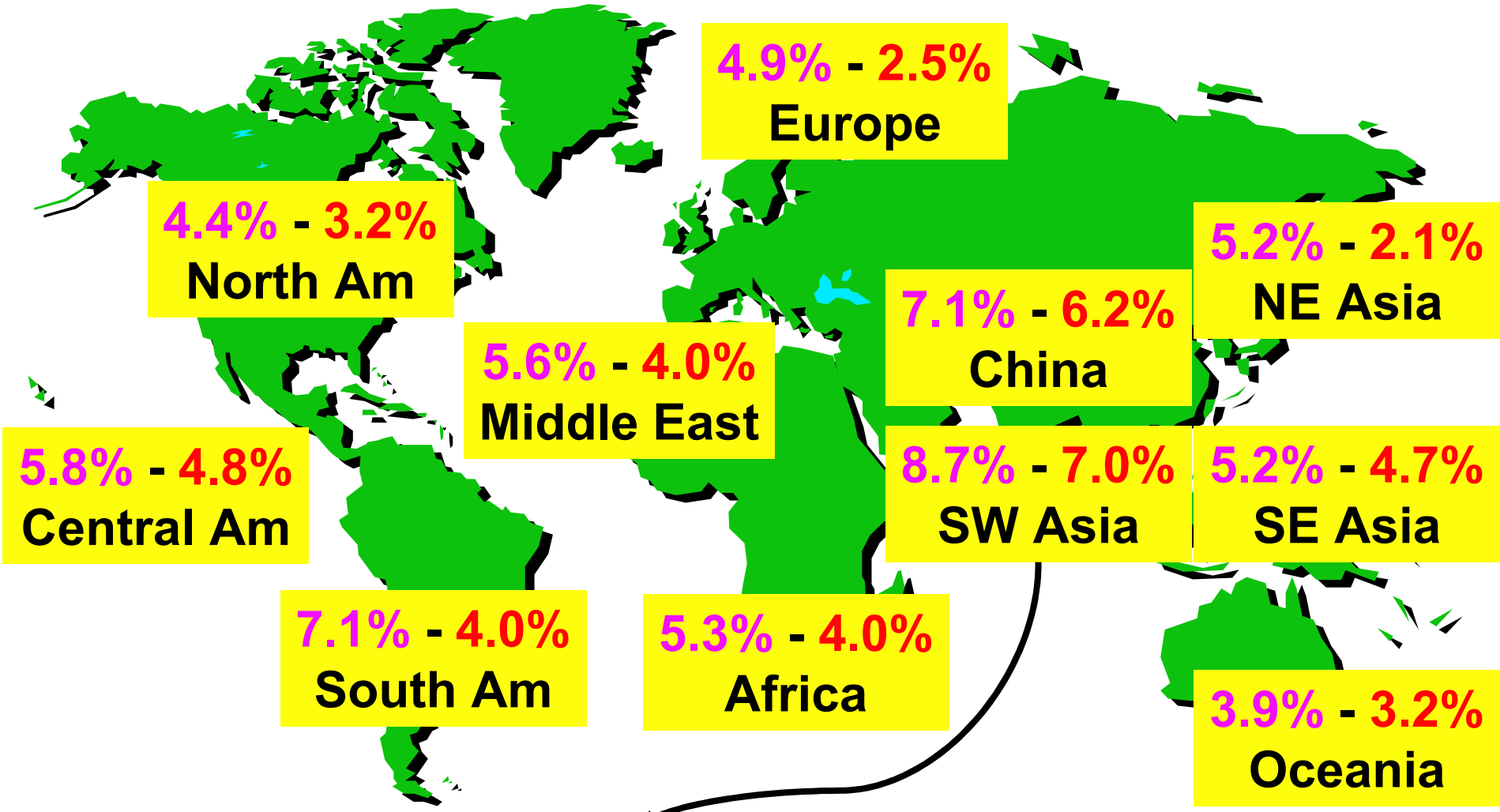
GDP and Domestic RPM: 2002-2025 Projected Performance



$12,800 B GDP

800 B RPM

Regional Traffic Growth
GDP Growth



10 people in front of you in line become 62 by 2025

Productivity…

- 20 plus new airports in China
- Major hubs in Japan and Korea
- Significant Chinese economic growth
- Greater Pacific Rim traffic growth than North Atlantic
- Greater Asia and Oceania to Europe traffic growth
- Larger share of the world used for aviation without significant ATC ground Infrastructure
- Economic growth depends on aviation as opposed to aviation following economic growth

RPM Factoids:
Worldwide
3.2% economic growth
5.1% passenger traffic growth
6.4% cargo traffic growth

To sustain GDP, the number of aircraft operating must grow to carry the passengers

Planes…

WHICH WAY FORWARD?

Planes…

- **The Boeing Bet** - smaller capacity, more frequency
- **The Airbus Bet** - Bigger new large aircraft
- **The RJ Bet** - more aircraft over longer segments with more frequency of service
- **The Business Jet Bet** - significant growth segment with greater frequency - fractional ownership is just beginning global fractionals have a strong business case
- **The Micro-jet Bet** - faster, cheaper, better
- **The Military Bet** - UAV's and increased airspace needs for training
- **The Recreational Pilot** - more opportunity and access

The smart money is to cover all bets - the changing fleet mix will require significant global changes in airspace and procedures to realize the best return on aircraft investment

Planes…

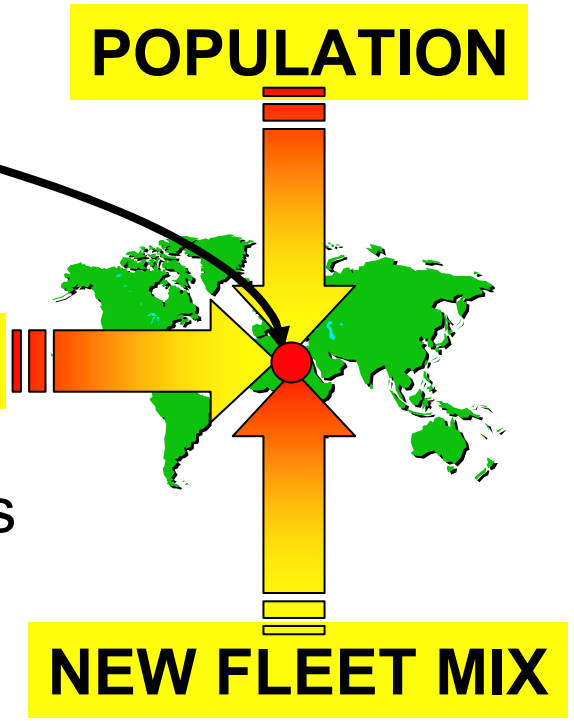
Air transport aircraft set the performance today - will they in 2025? The mix gets more complicated

- RJ's climb slower cruise slower than larger air carriers
- Business Jets climb faster, cruise higher and climb higher than larger air carriers
- Micro-jets climb slower, cruise slower and climb into the same airspace as larger air carriers
- Turbo-props and pistons "own" the airspace below FL180

Air carrier aircraft, RJ's, business jets and micro-jets can fly the same approaches, but each has quite different climb and descent profiles

Passing maneuvers are needed on oceanic tracks for mixed Mach operations

The Point…



- Growth of Nations requires more operations
- Nations are building airports
- Most connecting “city pairs” pass through “procedural airspace” at separation penalties
- Lateral separation becomes more valuable than vertical separation
- Mixed Mach operations require passing
- Fractionals, micro-jets, and UAVs are in the “air carrier airspace”
- Oceanic weather becomes increasingly important for separation
- Autonomous aircraft operations overcome “procedural airspace”
- Critical need to improve Communications and build on “sense and avoid” as supplement to “see and avoid” (ADS-B)
- Remember that a fleet avionics change is a 7-10 year process 2025 becomes 2015 for start of changes